MICROBIOLOGY
(BIOT 2104)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Leghaemoglobin mainly protect the enzyme
(a) Nitrogenase (b) Catalase
(c) Peroxidase (d) None of these.

(ii) Most common gaseous sterilizing agent is
(a) heavy metals (b) ethylene oxide
(c) alcohols (d) none of these.

(iii) Periplasmic space is present in
(a) mould (b) archaebacterium
(c) protozoa (d) gram negative bacteria.

(iv) Source for gamma radiation is radioactive
(a) Co (b) Ni (c) Mo (d) None of these.

(v) Murein is also known as
(a) Peptidoglycan (b) Lipopolysaccharides
(c) Lipoprotein (d) Heteropolysaccharides.

(vi) Cell wall inhibiting antibiotic is
(a) Penicilin (b) Streptomycin
(c) Tetracycline (d) none of these.

(vii) Microbes utilize carbon dioxide as source of carbon is known as
(a) prototroph (b) auxotroph
(c) autotroph (d) lithotroph.

(viii) Heterocysts present in
(a) Rhizobium (b) Cyanobacteria
(c) Azotobacter (d) None of these.

(ix) Which one among the following is a motile spore?
(a) Conidiospores (b) Zoospores
(c) Blastospores (d) Chlamydospores.

(x) Object placed beyond 2F of a convex lens is used to produce image in
(a) Camera (b) Telescope
(c) Microscope (d) Magnifying glass.

Group – B

2. (a) Discuss the different pigments present in algae.
(b) What are the different commercial products available from algae?
(c) Describe the structure of Diatoms.
2 + 5 + 5 =12

3. (a) Briefly describe the process of replication of Bacteriophage.
(b) Describe the functions of bacterial capsules.
7 + 5 = 12

Group – C

4. (a) What are the advantages of Electron microscope over Optical microscope? Glass lens is never used in an Electron Microscopes - Why.
(b) Electron microscopes are operated in a low pressure or in vacuum – Explain.
(c) How can you increase the Resolution of a Microscope?
(3 + 2) + 3 + 4 = 12

5. (a) Briefly explain differential media with suitable example.
(b) How aerobic bacteria can tolerate excess level of oxygen?
(c) What is tyndallaisation?
4 + 4 + 4 = 12

Group – D

6. (a) Briefly explain Phosphoketolase pathway.
(b) Distinguish fermentation and anaerobic respiration with example.
(c) Define photoautotrophs and classify them with example.
5 + 3 + 4 = 12

7. (a) Discuss the mode of protection of nitrogenase of symbiotic N2 fixing bacteria.

   (b) How sulphate is incorporated by assimilatory sulphate reduction?

   (c) Define cyclic photophosphorylation.

4 + 4 + 4 = 12

Group – E

8. (a) Briefly describe ammonification and denitrification process.

   (b) Name two different waterborne bacterial diseases and write their causative agents.

   (c) Give example of one fungi that acts as biofertilizer.

   (d) What is the mode of action of choleragen?

6 + 2 + 1 + 3 = 12

9. (a) What are phosphate solublizing bacteria? Why are they important?

   (b) Distinguish antagonism and competition.

   (c) What is the difference between commensalism and cometabolism?

4 + 4 + 4 = 12